

CLAIMS

1. An injection device comprising an outer housing inside which is located
5 a barrel for holding a volume of a medicament; a needle at one end of the barrel, the needle and barrel being such that at least part of the needle is axially moveable in and out of said outer housing but is biased to be normally wholly inside said housing;
10 a plunger, axially moveable within the barrel; an inner housing intermediate the outer housing and the barrel and plunger; and an energy source in communication with said 15 inner housing, wherein the inner housing is moveable by the energy source between three positions, namely a first position in which the inner housing is in communication with both the plunger and the barrel 20 such that, in use, the plunger and barrel are movable axially so as to move at least part of said needle out of the outer housing; a second position in which the inner housing is in communication with the plunger but not the barrel such 25 that, in use, said plunger is movable axially into said barrel so as to expel medicament through the needle; and a third position in which the inner housing is in communication with neither the plunger nor the barrel such that, in use, the plunger and barrel are able to 30 retract in order to retract the needle into the outer housing.
2. An injection device as claimed in claim 1 wherein
35 said inner housing includes one or more radially flexible tags.

3. An injection device as claimed in claim 2 wherein one or more of said tags is located at the end of a resiliently flexible leg..

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4. An injection device as claimed in claim 2 or claim 3 wherein one or more of said tags are situated at the rear end of the inner housing and are moveable radially into and out of communication with the plunger.

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5. An injection device as claimed in any of claims 2-4 wherein said tags are biased radially inwardly into communication with said plunger, preferably by communication with said outer housing.

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6. An injection device as claimed in any of claims 2-5 wherein said tags are stored in their relaxed condition, before initiating an injection.

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7. An injection device as claimed in any of claims 2-6 wherein each rear tag is moveable out of communication with the plunger when aligned with a corresponding recess in the outer housing.

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8. An injection device as claimed in any of claims 2-7 wherein each rear tag is substantially T-shaped.

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9. An injection device as claimed in claim 2 or claim 3 wherein one or more of said tags are situated at the forward end of the inner housing and are moveable radially into and out of communication with the barrel.

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10. An injection device as claimed in claim 9 wherein

said forward tags are biased radially inwardly into communication with said barrel, preferably by communication with said outer housing.

5 11. An injection device as claimed in claim 9 or claim 10 wherein said forward tags are stored in their relaxed condition, before initiating an injection.

10 12. An injection device as claimed in any of claims 9-11 wherein each forward tag is moveable out of communication with the barrel when aligned with a corresponding recess in the outer housing.

15 13. An injection device as claimed in any of claims 9-12 wherein each forward tag is substantially L-shaped.

20 14. An injection device as claimed in any of the preceding claims wherein said energy source is a compressed gas.

15. An injection device as claimed in any of claims 1-13 wherein said energy source is a spring.

25 16. An injection device as claimed in any of the preceding claims further including means for allowing the inner housing to move axially only forward with respect to the outer housing.

30 17. 17. An injection device as claimed in claim 16 wherein said means is an arrangement of serrations, barbs, ratchet teeth or the like intermediate the housings.

35 18. An injection device as claimed in any of the

preceding claims further comprising guide means for guiding, in use, the relative axial movement of the inner and outer housings, the guide means preferably comprising one or more protrusions on said inner housing which, in use, cooperate with corresponding recesses on an interior surface of said outer housing.

- 5 19. An injection device as claimed in any of the preceding claims wherein said needle is biased to be normally wholly inside said housing by means of a spring intermediate the barrel and the outer housing.
- 10 20. An injection device as claimed in any of the preceding claims wherein the needle is removable from said device.
- 15 21. An injection device as claimed in any of the preceding claims wherein said needle, barrel and plunger are removable from said device.
- 20 22. An injection device as claimed in any of the preceding claims further including a removable needle cover which protects the needle during storage before use.
- 25 23. An injection device as claimed in claim 22 wherein said needle cover includes means for pulling a protective rubber sheath or the like from said needle when said needle cover is removed from the device.
- 30 24. An injection device as claimed in claim 23 wherein said pulling means includes a floating rivet
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intermediate the needle cover and the protective rubber sheath or the like, whereby twisting forces applied to said needle cover are substantially prevented from being transmitted to said rubber sheath or the like.

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25. An injection device as claimed in any of claims 22-24 wherein the presence of said needle cover on said device serves as a safety lock, substantially preventing relative forward movement of said outer housing.
26. An injection device as claimed in any of the preceding claims further comprising a viewing window in said barrel aligned with a viewing window in said outer housing such that said medicament can be viewed by a user prior to an injection taking place.
27. An injection device as claimed in claim 26 wherein, in use during an injection, said inner housing moves intermediate said viewing window in the outer housing and said barrel so as to obscure the window in the barrel from the user's view.
28. An injection device as claimed in any of the preceding claims further comprising means for emitting an audible and/or physical indication to a user that the injection is complete.
29. An injection device comprising an outer housing inside which is located a barrel for holding a volume of a medicament; a needle at one end of the barrel, the needle and barrel being such that at least part of the needle is axially moveable in and out of said outer

housing but is biased to be normally wholly inside said housing;

a plunger, axially moveable within the barrel;

an inner housing intermediate the outer housing and the barrel and plunger; and

an energy source in communication with said inner housing,

wherein the inner housing is moveable by the energy source between two positions, namely

10 a first position in which the inner housing is in communication with the plunger but not the barrel such that, in use, said plunger is movable axially into said barrel so as to expel medicament through the needle; and

15 a second position in which the inner housing is in communication with neither the plunger nor the barrel such that, in use, the plunger and barrel are able to retract in order to retract the needle into the outer housing.

20 30. An injection device comprising an outer housing adapted to receive:

a barrel for holding a volume of a medicament;

25 a needle at one end of the barrel, the needle and barrel being such that at least part of the needle is axially moveable in and out of said outer housing but is biased to be normally wholly inside said housing; and

a plunger, axially moveable within the barrel,

characterised in that the injection device further

30 comprises:

an inner housing intermediate the outer housing and the barrel and plunger; and

an energy source in communication with said inner housing,

35 wherein the inner housing is moveable by the energy

source between three positions, namely

5 a first position in which the inner housing is in communication with both the plunger and the barrel such that, in use, the plunger and barrel are movable axially so as to move at least part of said needle out of the outer housing;

10 a second position in which the inner housing is in communication with the plunger but not the barrel such that, in use, said plunger is movable axially into said barrel so as to expel medicament through the needle; and

15 a third position in which the inner housing is in communication with neither the plunger nor the barrel such that, in use, the plunger and barrel are able to retract in order to retract the needle into the outer housing.

31. An injection device as claimed in claim 29 or claim 20 having all of the features of any of claims 2-28.

32. An injection device substantially as described herein with reference to and as illustrated in any appropriate combination of the accompanying drawings.